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WITNESS my hand this
Tenth day of November 2003

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"MULTI PURPOSE POLE"

Field of the Invention

This invention relates to poles, which are used particularly though not solely for the mounting of items such as streetlights, signs, traffic signals, pedestrian signals, security cameras, and banners.

Background to the Invention

Poles for the mounting of streetlights, signs, pedestrian signals, traffic signals, security cameras, banners and the like are well known and generally take the form of structural columns with out reach arms and brackets fitted at various positions to support lights, signs and other ancillary items at desired heights and positions. These poles are generally made from hard wood, reinforced concrete or from tubular galvanised steel or extruded aluminium. Tubular poles have the advantage of the ability to hide switchgear, cables and the like inside the pole.

Australian Patent No. 741370 applied for by the Council of the City of Sydney and published in year 1998 describes " A Multi-function Pole" comprising a hollow column with one or more internal or recessed tracks to aid the mounting of ancillaries, such as street lights, signs, and the like. Although an improvement in the art that invention has a number of limitations and is relatively expensive to manufacture.

One major disadvantage of internal or recessed tracks is that the geometry of the inside of the pole makes it difficult to simply reinforce the pole because the inside profile of the pole is not round and the tracks take up significant space inside the pole.

Tubular poles can also suffer from internal corrosion because of moisture ingress.

Fluted cladding is often fitted to the lower part of street poles to improve appearance, hide access hatches and make it difficult to add unwanted graffiti or bills to the lower part of poles.

It is the object of the present invention to overcome or ameliorate one or more of the disadvantages of the prior art, reduce the cost of pole manufacture and provide a useful alternative.

Summary of the Invention

One aspect of the present invention provides a pole assembly for supporting one or more fixtures, the pole assembly comprising a column of generally one piece round tubular section with two or more integrally formed longitudinal external tracks which extend along its length for the mounting of ancillaries, such as street light arms, traffic signals, signs, banner arms, security cameras and the like.

A further aspect of the invention provides longitudinal grooves inside the column adjacent to the external tracks to aid in fitting a plate, moulding, die-casting or extruded section inside the column. These items could be used to reinforce the pole, divide the interior of the column into 2 or more sections, or be utilised for the mounting of switchgear or the like.

One embodiment of the invention comprises a composite pole assembly for supporting one or more fixtures, the pole assembly comprising a structural outer tube with external tracks as described above, with an internal structural reinforcing sleeve fitted for part of its length. Preferably, the structural sleeve would be of generally round tubular profile.

Another aspect of the invention is a pole where the bottom section is generally as described above, and the top section is a telescopic round tube, which protrudes from the top of the top of the lower section with external tracks. The top section may or may not include one or more internal integral tracks.

A further aspect of the invention is a low cost method of attaching fluted cladding to the pole where the height of the cladding above the ground level is readily adjusted on site following pole erection. The one or more pieces of interlocking cladding is held in place by recessed circular collars that fit around the pole at either end of the section of the pole where the cladding is applied. Only a single fastener is required to lock each collar in place and the cladding is captured between the two ~~collars~~ without the need for any fixing holes in the cladding itself.

Another embodiment of the invention is a deformable clamp block that can be readily attached to any exposed part of the external track on site without the need to slide the clamp into position from the end of the pole. Various forms of this block can be used to fit signs, traffic signals, light brackets, security camera brackets, banner arms, cable exits and the like to the external tracks where required without the need to drill additional fixing holes in the pole.

A further aspect of this invention is a method of attaching an outreach arm where the groove inside the pole is utilised to prevent rotation of the arm and the repositioning of a deformable clamp block is used to achieve a limited adjustment on the angle of the arm relative to the pole.

In another preferred embodiment, a ventilated pole cap is employed to aid evaporation of moisture that would otherwise be trapped inside the pole, thereby minimising the likelihood of internal corrosion.

Brief Description of Drawings

Notwithstanding any other forms that may fall within its scope, some preferred forms of the invention will now be described by way of example only with reference to the accompanying drawings in which:

Figure 1 is a horizontal cross section of a pole with integral external tracks and longitudinal internal grooves adjacent to the tracks according to one embodiment of the invention.

Figure 2 is the cross section of the pole shown in Figure 1, with internal dividers inserted.

Figure 3 is the cross section of the pole shown in Figure 1,with an internal reinforcing sleeve fitted.

Figure 4 is a perspective view showing the attachment of a telescopic pole top with internal tracks for attachment of ancillaries.

Figure 5 is a perspective view of a pole assembly with outreach light arm, street name sign, fluted cladding and ventilated cap shown.

Figure 6 is a horizontal cross section of the lower portion of a pole assembly showing the embodiment of removable fluted cladding.

Figure 7 is a vertical cross section of the lower portion of a pole assembly, depicting the fluted cladding, recessed collars and fasteners that hold the collars in place.

Figure 8 is a cross section of the clamp block embodiment of the invention showing the clamp in the open position.

Figure 9 is a cross section of a clamp block in the closed position holding a street name sign to a pole.

Figure 10 is a horizontal cross section through the assembly of the outreach arm to the pole shown in Figure 5.

Figure 11 is a horizontal cross section showing engagement of the outreach arm spigot assembly in the internal groove in the pole assembly shown in Figure 5.

Figure 12 is a vertical cross section showing assembly of the outreach arm and ventilated cap to the pole assembly shown in Figure 5.

Detailed Description of the Preferred Embodiments

The horizontal cross section of a pole 1, with four integral external tracks 2 and four longitudinal internal grooves 3 adjacent to the tracks 2, is depicted in Figure 1. The pole would normally but not necessarily be manufactured from extruded aluminium alloy. It could have two or more integral external tracks 2.

Figure 2 shows how the longitudinal internal grooves 3 inside the pole 1 aid in the fitting of a plate 4, moulding, die-casting, extruded section or the like inside the column. These items could be used to reinforce the pole, divide the interior of the column into 2 or more sections, or be utilised for the mounting of switchgear or the like.

The horizontal cross section of a composite pole assembly, comprising a structural outer tube with external tracks 1, with an internal structural reinforcing sleeve 5 fitted for part or all of its length is shown in Figure 3. The reinforcing sleeve 5 would generally be of round tubular profile. It may be manufactured from a structural grade of extruded aluminium, galvanised steel or other structural material. It would normally but not necessarily be used to reinforce the lower part of the pole 1. The reinforcing sleeve 5 may include internal tracks or grooves to aid in the mounting of ancillary items such as switchgear inside the pole. The sleeve 5 could be fixed inside the pole 1 by adhesive, fasteners, welding or a combination of these.

The attachment of a telescopic pole top 6, with internal tracks 7 for attachment of ancillaries, is shown in Figure 4. The pole top 6 slides inside the pole 1 with a typical overlap of three pole 1 diameters. It is held in place by adhesive, fasteners such as security screws 8, welding or a combination of these items.

Figure 5 is a perspective view of a pole assembly with outreach arm 9, streetlight 10, deformable clamp block 11, street name sign 12, fluted cladding 13, recessed circular collars 14, base plate 15 and ventilated cap 16 shown.

A horizontal cross section of the lower portion of a pole assembly in Figure 6 shows the fluted cladding 13 fitted around the pole 1 and held in place by the recessed circular collar 14. The cladding 13 is shown fitted in 4 sections but it could be in any number of sections. The cladding 13 could be manufactured from extruded aluminium alloy, sheet metal, extruded plastic, plastic mouldings or other appropriate material. The collars 14 could be made from cast, moulded, spun or machined metal or plastic.

Figure 7 is a vertical cross section of the lower portion of a pole assembly depicting the fluted cladding 13, recessed circular collars 14 and fasteners 17 that hold the collars 14 in place. Only a single fastener 17, such as a grub screw or security screw is required to lock each collar 14 in place and the cladding 13 is captured between the two collars without the need for any fixing holes in the cladding 13 itself. This is a low cost method of attaching cladding with the further advantage that the height of the cladding assembly above the ground level is readily adjusted on site following pole erection.

A deformable clamp block 11 in the open or pre-deformed state is shown in Figure 8. The fasteners 18 shown in Figure 9 are used to deform or bend the block 11 until it locks onto the external track 2 of the pole 1. The clamp block 11 shown in Figure 9 is used to attach a street name sign to pole 1 via fasteners 19. Various forms of clamp block 11 can be used to fit traffic light brackets, pedestrian signals, security cameras, banner arms, cable exits and the like to the external tracks 2 wherever required. The clamp block 11 could be manufactured from machined extruded aluminium alloy, or a metal casting or by plastic moulding.

Figures 10, 11 and 12 show details of the assembly of an outreach arm 9 to the pole assembly shown in figure 5. The outreach arm 9 slides over spigot 20 that fits through a clearance hole in the side of pole 1. A transition casting or moulding 23 is used to hide the small gap between the spigot 20 and the clearance hole. A deformable clamp block 11 is fitted to the external track 2, on directly the opposite side of pole 1 to where the outreach arm 9 sticks out of pole 1. Screw 22 is used to clamp the outreach arm spigot 20 in place via the attached spigot end plug 21. When screws 18 and 22 are loosened, clamp block 11 can be slid up or down pole 1 for a small distance to achieve a limited adjustment on the angle of the outreach arm spigot 20 to

the pole. The hole in pole 1 through which screw 22 passes is machined deliberately oversize or is slotted to facilitate this adjustment. Figures 11 and 12 also show that the outreach arm end plug 21 has a tongue 26 on either side of screw 22. The tongue 26 fits into groove 3 inside pole 1 to prevent rotation of the end plug 21. The end plug 21 is fixed to the outreach arm spigot 20 by appropriate fasteners, adhesive or welding. The outreach arm 9 is in turn is fixed to the outreach arm spigot 20 by appropriate fasteners, adhesive or welding. Thereby the tongue 26 and groove 3 effectively prevent rotation of the outreach arm 9 and streetlight 10, which is usually but not necessarily fixed to the outreach arm 9.

A ventilated top cap 16 is shown in Figures 5 and 12. The cap 16 is attached to a largely hidden inner part of the cap 24 that is fixed to the inside of the top of pole 1 by welding, adhesive or appropriate fasteners such as screws or rivets. The outer cap 16 is fixed to the inner cap 24 by appropriate fasteners, adhesive or welding. Caps 16 and 24 are generally though not necessarily round in shape and can be manufactured from spun aluminium, machined metal, cast metal or plastic mouldings. Gaps between the caps and ventilation holes 25 in the inner cap 24 are employed to aid evaporation of moisture that would otherwise be trapped inside pole 1, thereby minimising the likelihood of corrosion inside the pole.

Claims

1. A tubular pole for supporting one or more items, the pole being of generally round cross section with two or more integral longitudinal external tracks to aid the mounting of items.

2. A tubular pole for supporting one or more items, the pole being of generally round cross section with two or more integral external tracks and internal longitudinal grooves adjacent to the tracks.

3. A tubular pole according to claim 2, with an internal structural reinforcing sleeve of round cross section fitted for part of its length.

4. A tubular pole where the bottom section is according to claim 2 or 3, and the top section is a telescopic round tube, which protrudes from the top of the top of the lower section with external tracks.

5. A tubular pole where the bottom section is according to claim 2 or 3, and the top section is a telescopic round tube, with 1 or more internal integral tracks, which protrudes from the top of the top of the lower section with external tracks.

6. A method of attaching fluted cladding to poles where one or more pieces of interlocking cladding is held in place by recessed circular collars that fit around the pole at either end of the section of the pole where the cladding is applied.

7. A deformable clamp block that can be attached to any exposed part of the external track on the poles described in claims 1 to 5, without the need to slide the clamp into position from the end of the pole.

8. A method of attaching an outreach arm to the poles according to claims 2 to 5, wherein the groove inside the pole is utilised to prevent rotation of the arm.

9. A method of attaching an outreach arm to the poles according to claims 1 to 5, wherein the repositioning of a deformable clamp block, according to claim 7, is used to achieve a limited adjustment on the angle of the outreach arm to the pole 1.

10. A method of attaching an outreach arm to the poles according to claims 2 to 5, wherein the groove inside the pole is utilised to prevent rotation of the arm and the repositioning of an external clamp block is used to achieve a limited adjustment on the angle of the outreach arm to the horizontal.

11. A pole according to any of claims 1 to 5, plus a ventilated top cap.

12. A pole assembly substantially as herein described with reference to any of the accompanying drawings.

Abstract

The present invention relates to poles for mounting of streetlights, traffic signals, signs, banners and the like.

One aspect of the invention provides integral external tracks to facilitate the mounting of ancillary items such as traffic signals, signs, security cameras and the like via a deformable clamp that can readily be attached to the external tracks after pole installation. Other aspects of the invention include a telescopic top section, ventilated top cap, a method for adjusting the angle of light arms and a low cost method of attaching fluted cladding to the pole where the height of the cladding above the ground level is readily adjusted on site following pole erection.

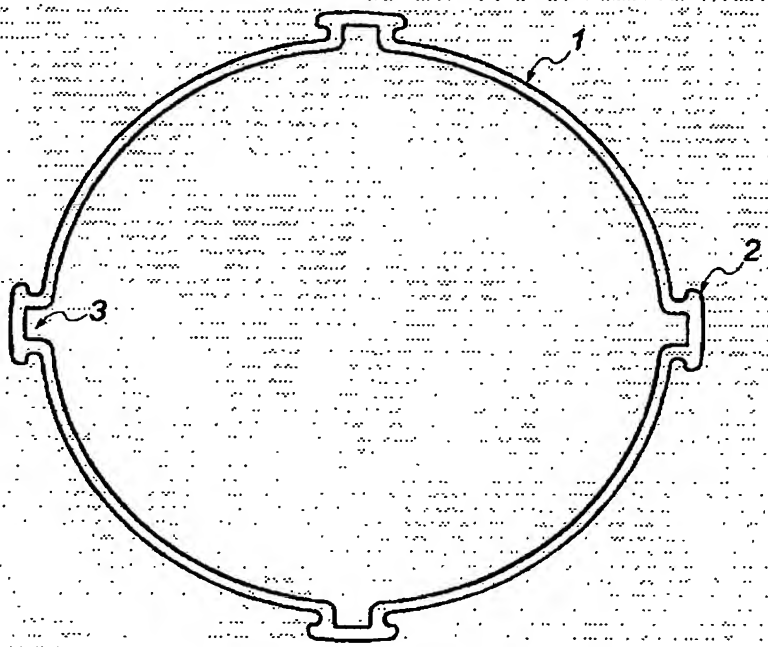

FIG. 1

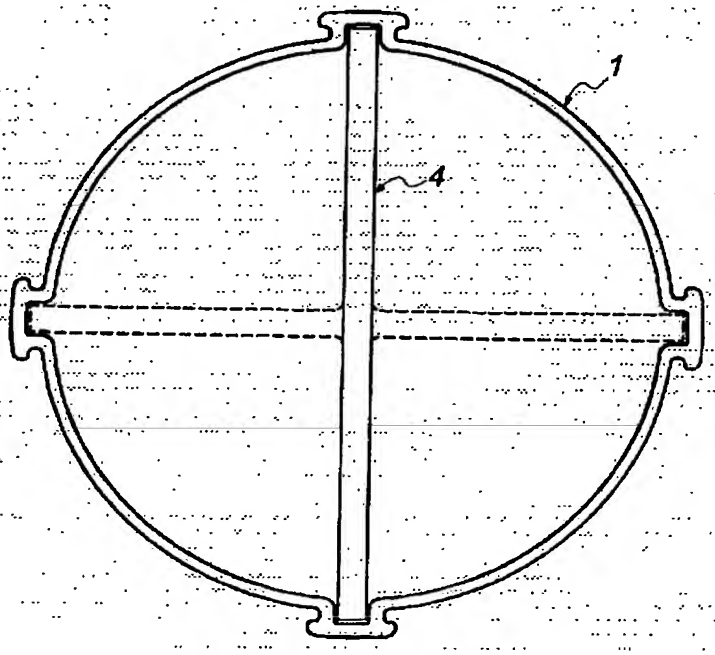

FIG. 2

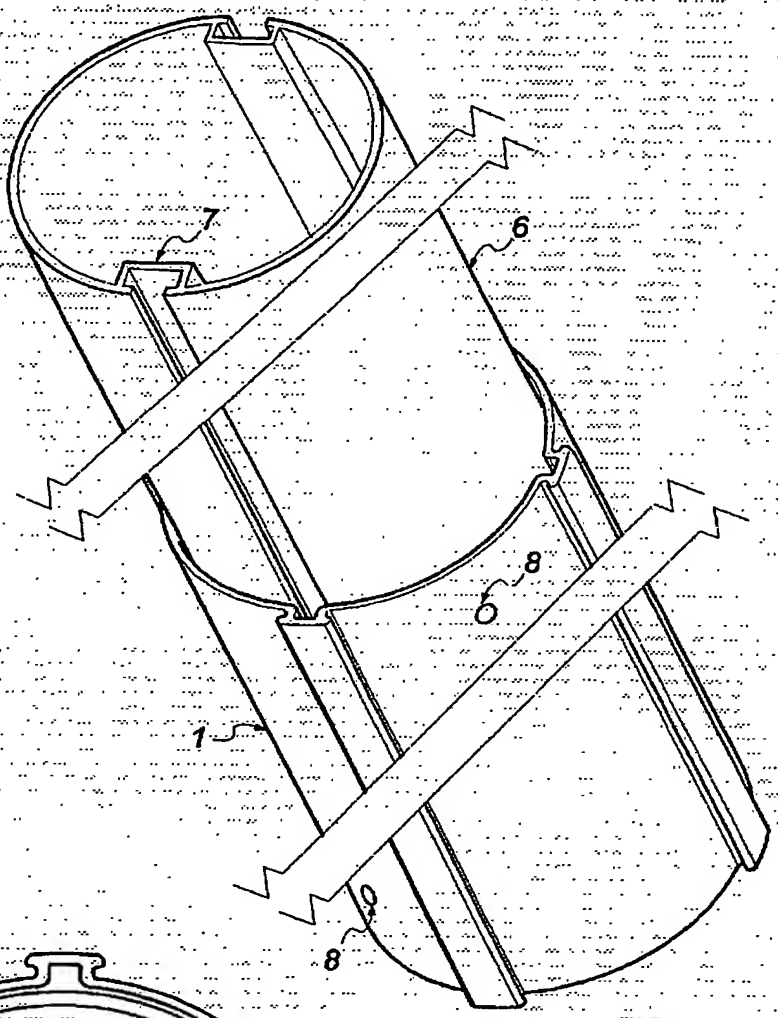

FIG. 4

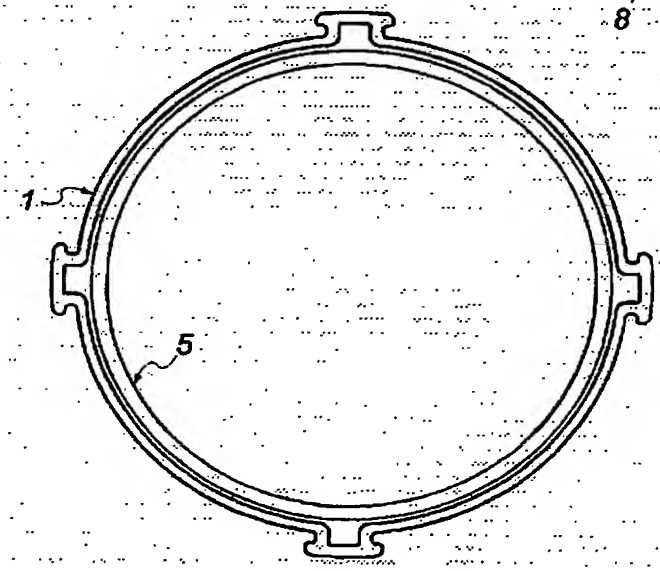

FIG. 3

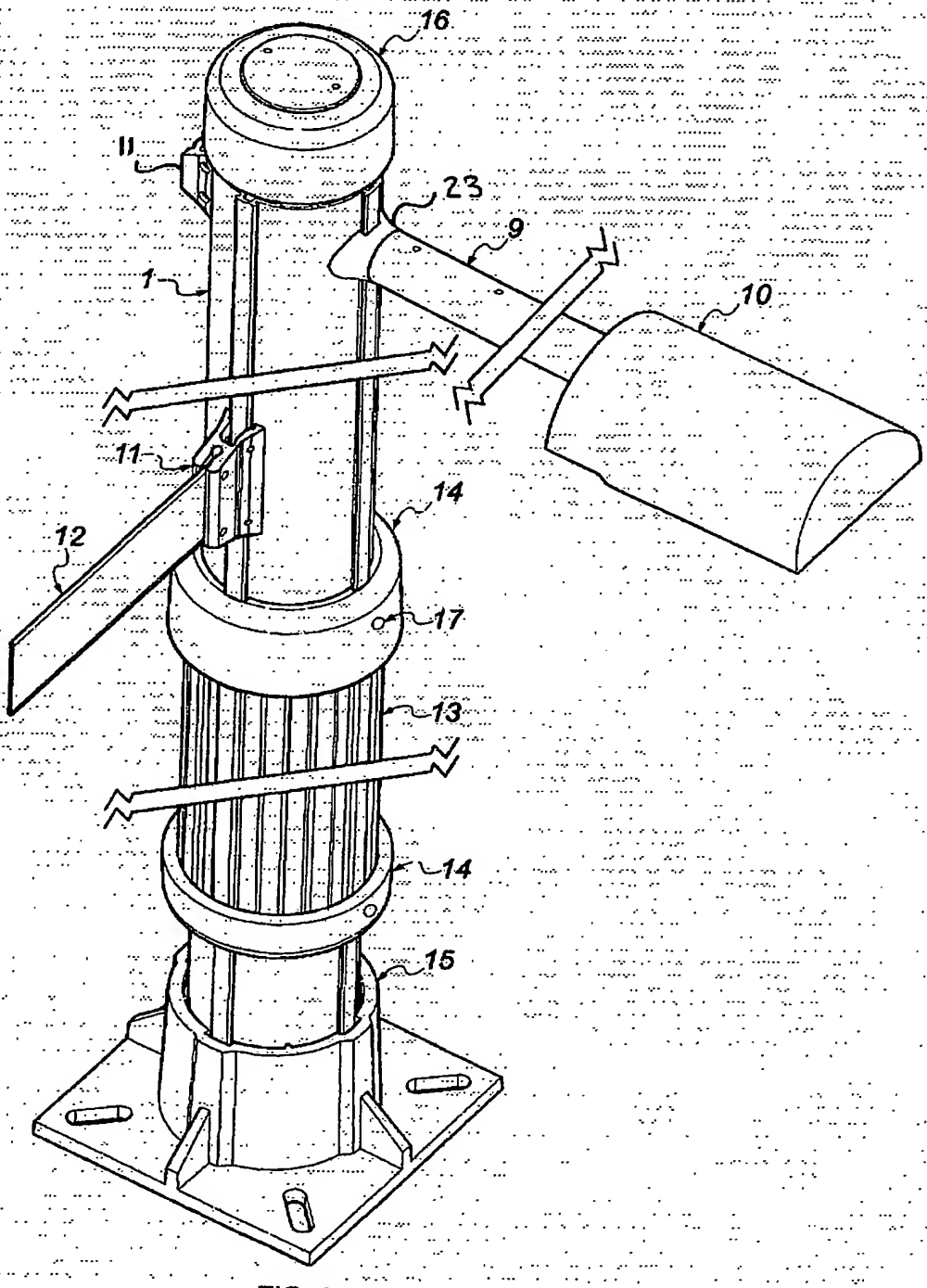

FIG. 5

II

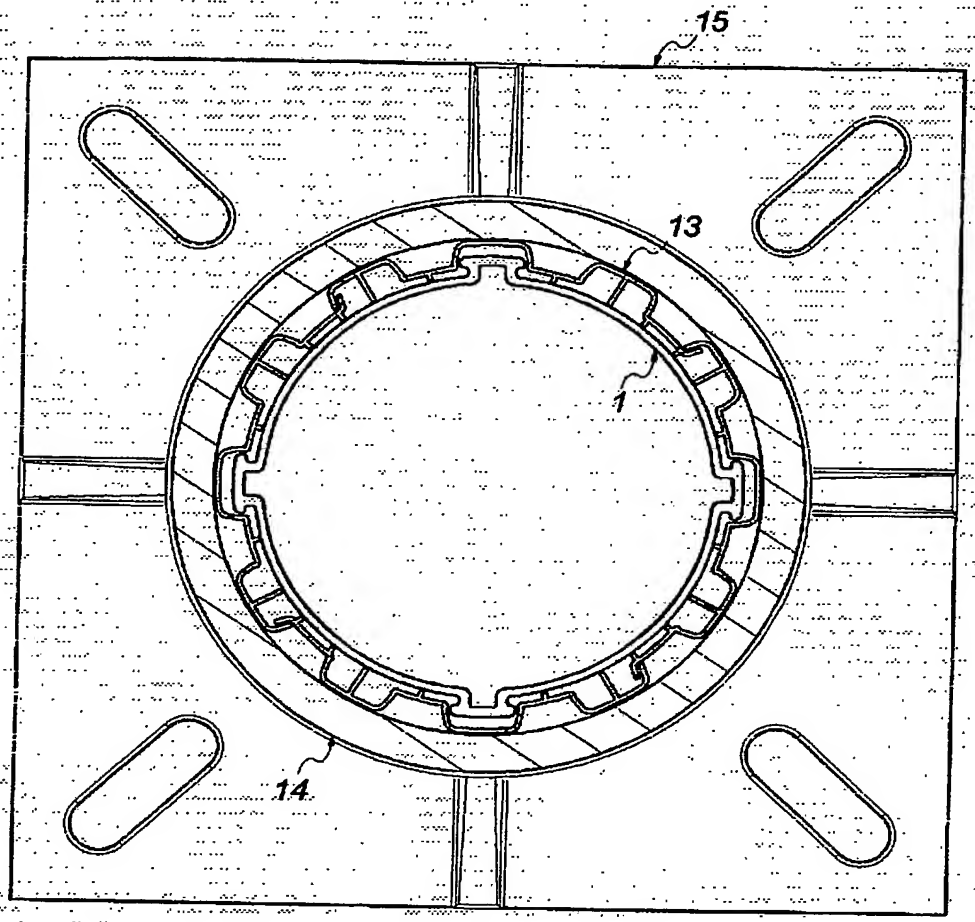

FIG. 6

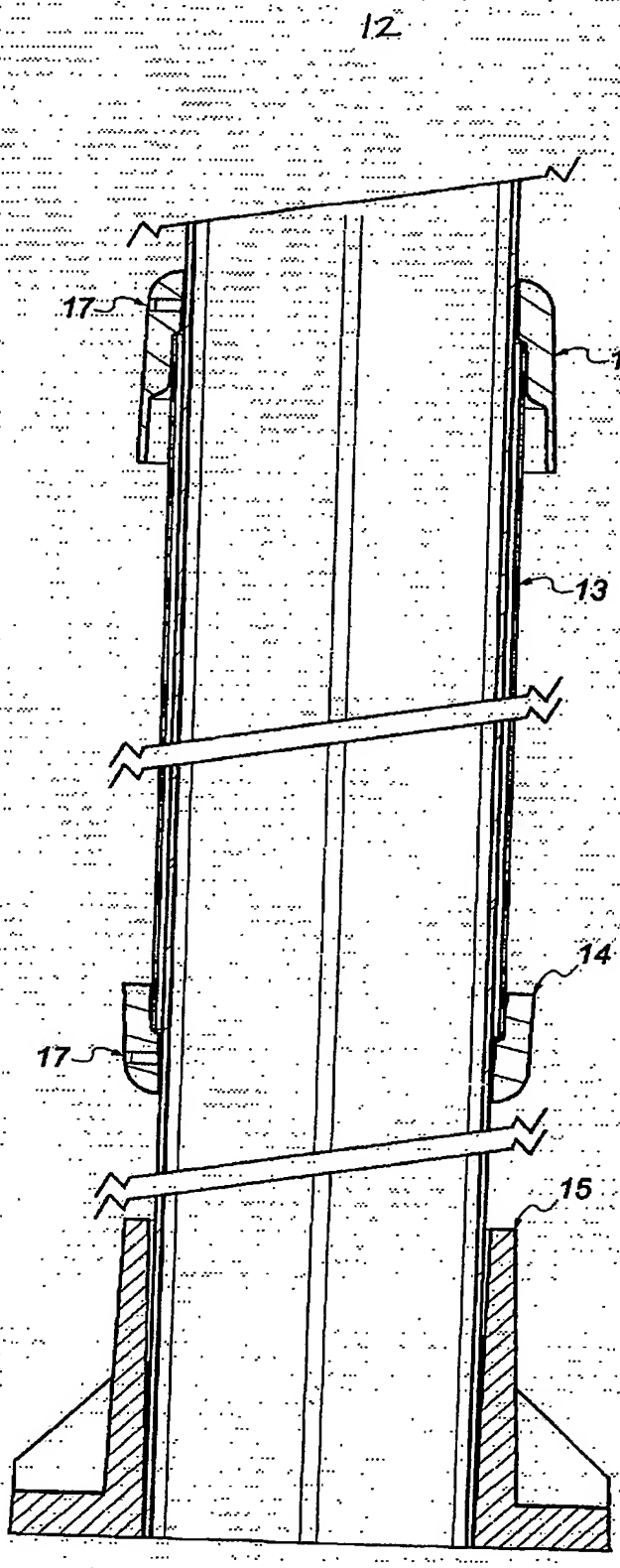

FIG. 7

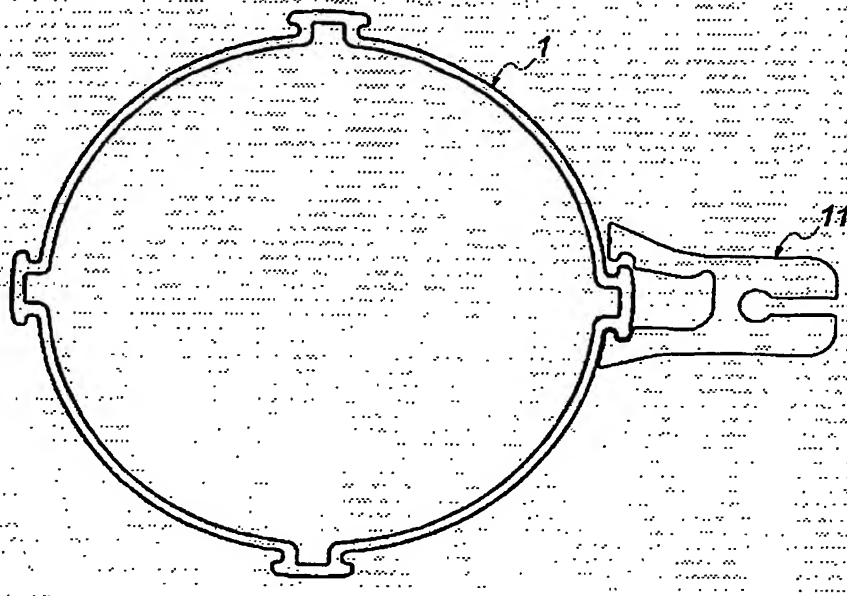

FIG. 8

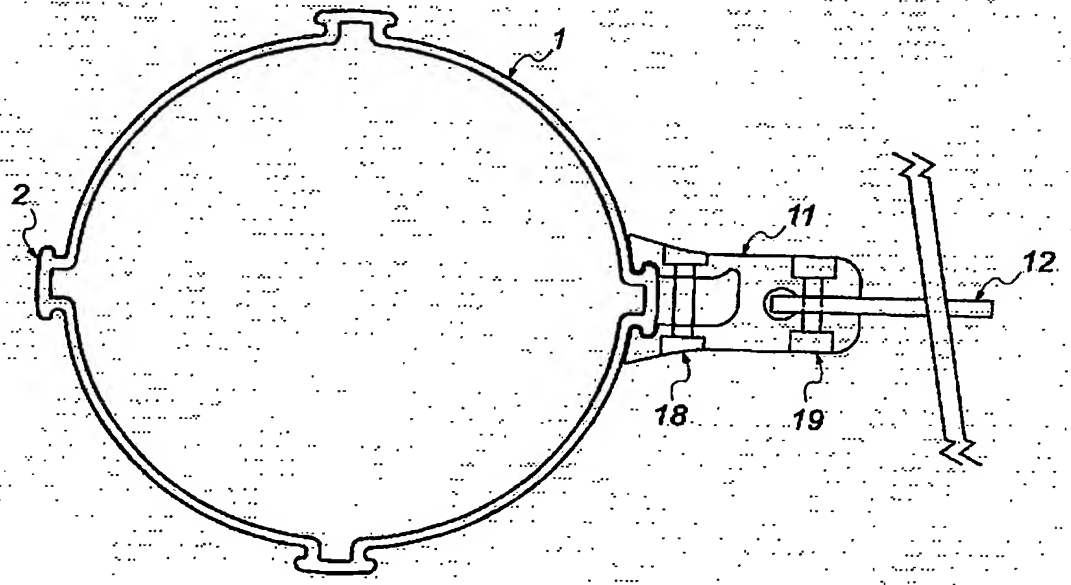

FIG. 9

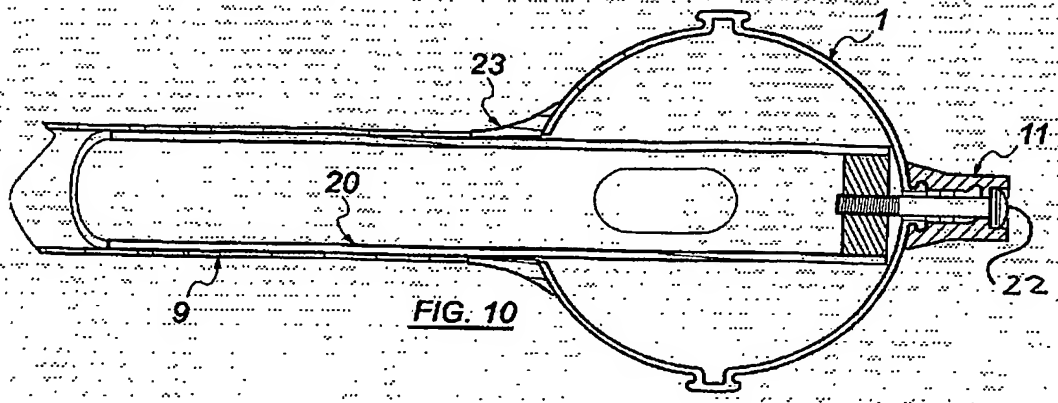

FIG. 10

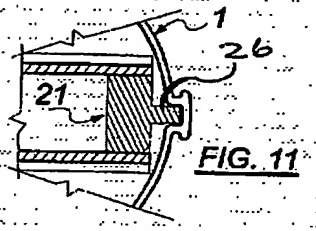

FIG. 11

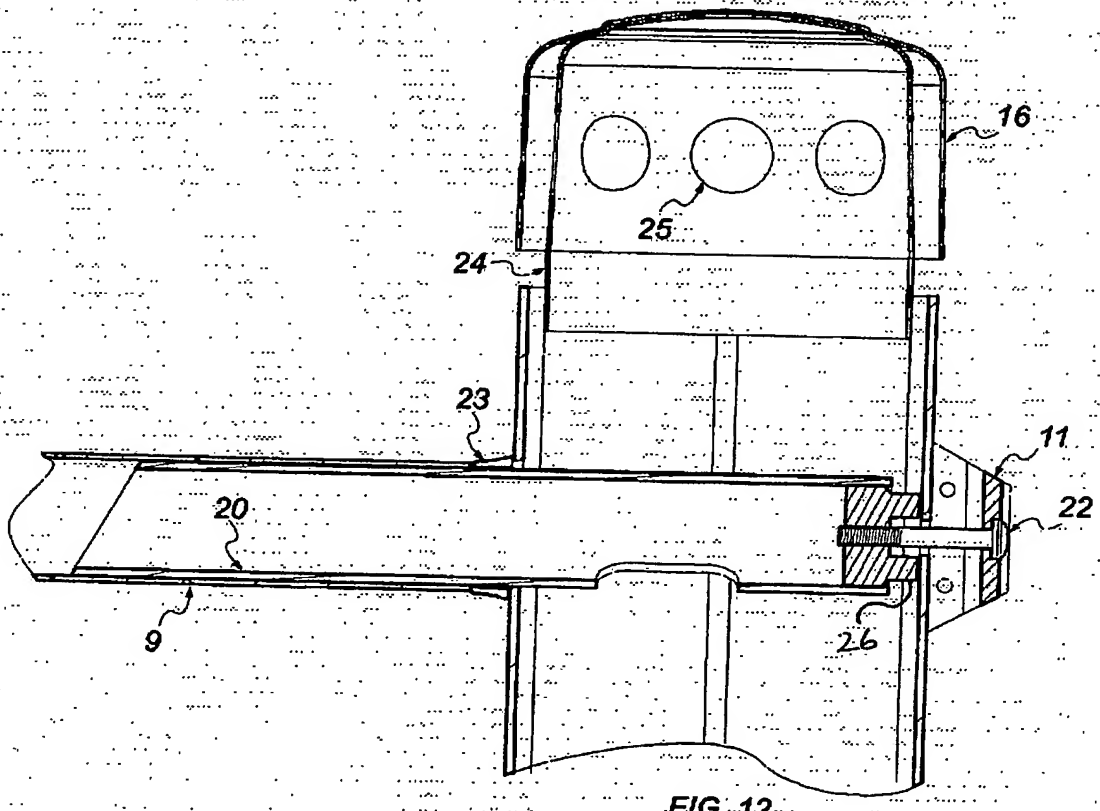

FIG. 12